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FINENESS GRADES OF WOOL TOPS

(First Revision)

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0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 March 1977, after the draft finalized by the Wool and Wool Products Sectional Committee had been approved by the Textile Division Council.

0.2 This standard, which was published in 1970, has been revised to modify the specifications of wool tops processed out of indigenous wool in respect of average fibre diameter and the fibre diameter distribution. The confidence limit of the average fibre diameter has also been amended.

0.3 It is sometimes very difficult to correctly determine the fineness of wool top on the basis of the fibres taken out from the yarn/fabric which has undergone a lot of processing during spinning, weaving and finishing.

0.4 Assistance has been derived in the formulation of this standard from ASTM Designation : D 472-69 'Specification for fineness of wool top and assignment of grade', issued by the American Society for Testing and Materials.

0.5 Due to wide variation in the fineness parameters of imported wool and indigenous wool from which the tops are manufactured, the fineness values of the tops have been specified separately. Further, the grades finer than 48s have not been specified for indigenous wool tops as the same are not yet available on a commercial scale.

0.6 The term 'grade' as used in this standard, should not be confused with the terms 'quality' and 'type'. 'Quality' is a term that includes not only fineness but also characteristics, such as length, crimp, strength, elasticity, lustre and colour, all of which effect the spinnability of wool and the properties of the yarn and fabric produced from the wool. 'Type' is a term designating a particular combination of characteristics appropriate to a specific use of descriptive of geographic origin, breed of sheep or preparation for market. Further, the Bradford designations which use the same grade designations, for example, 54s and 50s, as are used in standard, refer to the quality and not only to fineness.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the classification of fineness grades of the fibres in wool tops.

1.2 This standard is also applicable to wool yarns and fabrics processed on the worsted system. However, the test results obtained on the wool fibres removed from yarns and fabrics may not meet the specifications as given in the standard which are for wool tops. If these meet the specifications of next coarser grade, the same shall be considered as satisfying the grade for the purpose of grading of fibres in corresponding tops.

2. TERMINOLOGY

2.1 For the purpose of this standard, grade shall be a descriptive term used in rating of wool tops based on fineness, that is, average diameter and variation (dispersion) of fibre diameter (or fibre width).

3. GRADES

3.1 The specifications for various grades of wool tops made from imported and indigenous wools are given in Table 1.

4. METHOD OF TEST

4.1 Determine the diameter of wool fibres by the method given in IS:744-1977†. The number of observations to be made for this purpose shall be such as to obtain confidence limits of the mean within $\pm 1{\cdot}0$ μm at a probability level of 95 percent.

NOTE—The number of fibres to be observed in order to attain the above stated confidence limits of the mean shall be determined by the following formula, which, however, shall not exceed 1000.

$$n = \left(\frac{t\,\sigma}{E}\right)^2$$

*Rules for rounding off numerical values (*revised*).

†Method for determination of wool fibre diameter —Projection microscope method (*second revision*).

where

n = number of fibres;

t = probability factor (1·96 for 95 percent probability level);

σ = standard deviation of fibre diameter; and

E = desired precision of the mean, that is $\pm 1{\cdot}0$ μm.

4.2 Calculate the average fibre diameter and also determine the fibre diameter distribution.

5. ASSIGNMENT OF GRADE

5.1 Compare the average fibre diameter and fibre diameter distribution as determined in **4.2**, with the specifications given in Table 1. Assign to the wool top the grade that corresponds to the observed average fibre diameter and fibre diameter distribution. If the measured average fibre diameter and fibre diameter distribution correspond to a single grade, assign that grade to the top. If the fibre diameter distribution does not meet the requirement for the grade to which the average fibre diameter corresponds, assign to the wool top a dual grade, the second being next coarser than the grade to which the average fibre diameter corresponds.

5.1.1 A few examples illustrating the assignment of grade are given below:

Imported Wool Tops

Example 1:

Average fibre diameter	30·5 μm
Fibre diameter distribution, percent:	
30 μm and under	48
30·1 μm and over	52
50·1 μm and over	2
Assigned grade	50s

Example 2:

Average fibre diameter	30·5 μm
Fibre diameter distribution, percent:	
30 μm and under	42
30·1 μm and over	58
50·1 μm and over	3
Assigned grade	50s/48s

Indigenous Wool Tops

Example 3:

Average fibre diameter	34·5 μm
Fibre diameter distribution, percent:	
40 μm and under	72
40·1 μm and over	28
60·1 μm and over	5
Assigned grade	48s

Example 4:

Average fibre diameter	34·5 μm
Fibre diameter distribution, percent:	
40 μm and under	63
40·1 μm and over	37
60·1 μm and over	6
Assigned grade	48s/44s

Example 5:

Average fibre diameter	39·5 μm
Fibre diameter distribution, percent:	
40 μm and under	54
40·1 μm and over	46
60·1 μm and over	7
Assigned grade	40s

TABLE 1 SPECIFICATIONS FOR GRADES OF WOOL TOPS

(*Clauses* 3.1 *and* 5.1)

Sl No.	Characteristic	Imported Wool Tops																Indigenous Wool Tops				
		Finer than 80s	80s	70s	64s	62s	60s	58s	56s	54s	50s	48s	46s	44s	40s	36s	Coarser than 36s	48s	44s	40s	36s	Coarser than 36s
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
i)	Average fibre diameter range, μm:																					
	Lower limit	—	18·10	19·60	21·10	22·60	24·10	25·60	27·10	28·60	30·10	31·80	33·50	35·20	37·10	39·00	41·30	—	36·01	38·11	40·21	42·21
	Upper limit	18·09	19·59	21·09	22·59	24·09	25·59	27·09	28·59	30·09	31·79	33·49	35·19	37·09	38·99	41·29	—	36·00	38·10	40·20	42·20	—
ii)	Fibre diameter distribution, percent:																					
	25 μm and under, *Min*	95	91	83	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	30 μm and under, *Min*	—	—	—	92	86	80	72	62	54	44	—	—	—	—	—	—	—	—	—	—	—
	40 μm and under, *Min*	—	—	—	—	—	—	—	—	—	—	75	68	62	54	44	—	70	60	50	40	—
	25·1 μm and over, *Max*	5	9	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	30·1 μm and over, *Max*	1	1	3	8	14	20	28	38	46	56	—	—	—	—	—	—	—	—	—	—	—
	40·1 μm and over, *Max*	—	—	—	1	1·5	2	—	—	—	—	25	32	38	46	56	—	30	40	50	60	—
	50·1 μm and over, *Max*	—	—	—	—	—	—	1	1	2	2	—	—	—	—	—	—	—	—	—	—	—
	60·1 μm and over, *Max*	—	—	—	—	—	—	—	—	—	—	1	1	2	3	4	—	6	8	10	12	—

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